



General Diets

Infant/Pediatric Diets

General Description

The Pediatric Diet is a regular diet which is tailored to meet the nutrient needs of children in a form compatible with the child's developmental abilities, to promote health, growth and development. Portion sizes and number of feedings will depend on the age, sex, weight, rate of growth and activity level of the child. Additional calories, protein and other nutrients may be needed for disease conditions. The Nutrition Department Standards of Care provides guidance for the estimation of nutrient needs.

Indications for Use

The following guidelines can be used for healthy children based on their age. Modifications may need to be made for children with conditions or diseases which impact on their digestion, absorption, metabolism, or developmental skills and progress.

Nutritional Adequacy

In comparison to the Dietary Reference Intakes (DRIs), this diet is nutritionally adequate with a few exceptions.

Breast fed infants: Vitamin D supplementation (400 IU/day) is recommended for breast fed infants who are at increased risk of Vitamin D deficiency. (1) Infants at increased risk for vitamin D deficiency include those born to vitamin-D deficient mothers, those who have darker skin pigmentation and those who have limited exposure to sunlight. Flouride supplements (0.25 mg/day) may be needed after 6 months of age if the water supply is severely deficient in fluoride (<0.3 ppm). (2) Full term, breast fed infants require an additional source of iron beginning at 4 – 6 months. (3,4)

Toddlers/ Preschool/School Age/Adolescents: All requirements for vitamins and minerals can be met from a varied diet consistent with the U.S. Food Guide Pyramid. However some children may not consume adequate amounts of iron and calcium. At age 9 the DRI for calcium increases from 800 mg/day to 1,300 mg/day. Adequacy of iron intake should be evaluated to assess for iron deficiency anemia.

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The ideal source of nutrition during the first year of life is breast milk, with the introduction of age-appropriate foods at 4 – 6 months of age. Breast feeding provides numerous health benefits including nutritional, immunological, and psychological to infants. The American Academy of Pediatrics recommends infants be breast-fed for the first year of life and thereafter as long as it is mutually desired. (1)

Iron fortified commercial infant formula is the most appropriate alternative to human milk for infants who are not breast-fed or who are partially breast-fed. Infants should continue to receive iron-fortified infant formula until they are 12 months of age. (5) Low iron formula is not recommended. Many types of commercial infant formulas are available. The Clinical Center Nutrition Department Formulary carries one brand of each of the following types of formulas: cow's milk protein based, soy protein based, protein hydrolysate and free amino acid based infant formula. The Nutrition Department Formulary provides a listing of the brand names, nutrient composition and characteristics of each of these formulas.

Cow's milk is not recommended during the first 12 months of life for numerous reasons including its high renal solute load, inadequate vitamin and mineral composition, and due to the potential for protein sensitivity, gastrointestinal occult blood loss and iron deficiency anemia in infants. (5)

Introduction to Solids

The age at which to introduce solids should be individually determined according to nutrient needs, physiological maturation, and behavioral and developmental readiness. Typically by 4 to 6 months of age infants have lost the extrusion reflex and are able to swallow nonliquid foods. The introduction of an iron-fortified infant cereal such as rice allows for a complementary source of iron to the diet at a time when iron stores are becoming depleted. Solid food should be introduced via an infant spoon and not placed in an infant's bottle.

Foods should be introduced gradually one at a time with at least a 3-day interval between the introduction of new foods. Single ingredient foods should be introduced first starting with iron fortified infant cereals, and progressing to pureed vegetables and fruits and finally meats. By 1 year of age, an infant should be eating a variety of soft and chopped table foods from the different food groups found in the USDA's Food Guide Pyramid, drinking from a cup and eating 3 meals a day plus between meal snacks. Foods such as unpasteurized milk, honey, and raw eggs or foods made from these products should not be fed to infants due to the risk of food-borne

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illness. Foods that present a choking hazard such as, nuts, hard candy, and popcorn should not be fed to infants or young children. Foods such as hot dogs and grapes should be cut before presented to young children.

Toddlers and Preschool Children

The diet for toddlers and preschoolers should consist of a variety of foods of different textures, tastes, and colors provided throughout the day to provide adequate amounts of nutrients. Calories should be adequate to support growth and development and to reach a desirable body weight. Small frequent feedings are required to meet nutrient needs and can be achieved with three meals and between meal snacks. Fat is needed as a concentrated source of calories to meet energy needs and promote growth.

For this reason, fat should not be restricted in children under the age of 2 years.(6) Whole milk should continue until children are at least two years of age. Reduced or low fat milk may be introduced after two years of age. The American Academy of Pediatrics Committee on Nutrition recommends that healthy children older than 2 gradually adopt a diet that reflects the following pattern of nutrient intake (7)

- Saturated fats <10% of total calories
- Total fat (over several days): on average no more than 30% of total calories and no less than 20% of total calories
- Dietary cholesterol: <300 mg/day.

These guidelines are generally consistent with the 1992 National Cholesterol Education Program nutrition recommendations to lower blood cholesterol in children and adolescents. (6)

School Age Children and Adolescents

The diet for school age children includes a variety of foods provided throughout the day based on guidelines of the U.S. Food Guide Pyramid. Three meals per day with one to three snacks are recommended. The diets of healthy children over 5 years of age should be consistent with recommendations from the American Academy of Pediatrics and National Cholesterol Education Program as listed above.

Low Cholesterol/Saturated Fat Diets in Pediatrics

Children with elevated blood cholesterol or high LDL cholesterol should be prescribed the same nutrient intakes recommended above for healthy children, but with careful instruction, monitoring and followup by a health professional. (6,7). If, after at least 3 months on the diet, the minimum goals of therapy are not achieved, the child or adolescent should progress to a further reduction in saturated fat (<7%

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of total calories) and cholesterol (<200 mg/day) with instruction by a Registered Dietitian (R.D.) (6,7)

Overweight and Obesity in Pediatrics

Encouraging healthy eating habits and physical activity to promote a healthy weight is important for the prevention and treatment of obesity. In addition to the regular pediatric diet the Clinical Center Nutrition Departments offers many low fat versions of foods children typically like. Guidelines for the assessment and intervention in pediatric obesity can be found in the Nutrition Department Standards of Care. These guidelines are consistent with the Expert Committee Recommendations of the Maternal and Child Health Bureau, Department of Health and Human Services. (8)

Suggested Meal Plan

Age	Appropriate Foods	Amount/serving size
0-4 months	Breastmilk or iron fortified formula	On demand
4-6 months	Breastmilk or iron fortified formula	On demand
	Iron fortified infant cereal	1-2 tsp, 1 – 2 x/day
	Strained fruit and vegetables	1-2 tsp, 1-2x/day
6-9 months	Breastmilk or iron-fortified formula	30-32 oz/day (3-5 feeds)
	Iron fortified infant cereal	2-3 Tbsp, 2x/day
	Mashed or strained vegetables/fruit	2-3 Tbsp 2x/day
	Strained Meats	1-2 Tbsp 2x/day
9-12 months	Breastmilk or iron fortified formula	24-30 oz./day
	Iron fortified infant cereal	2-4 Tbsp, 2x/day
	Mashed or chopped vegetables/fruit	4-6 Tbsp 2x/day
	Strained meats	2-3 Tbsp, 2x/day
	Bread and bread products	½ to 1 serving

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Sample Menu for the Toddler and Preschool Child

Breakfast Whole milk (low fat for children >2 years) Cream of wheat Banana Margarine Whole-wheat toast	Lunch Whole milk (low fat for children >2 years) Beef patty Whole wheat bread Cooked carrots Margarine Canned peaches	Dinner Whole milk (low fat for children >2 years) Dinner roll Broccoli Margarine Mashed potatoes
Midmorning snack Vanilla wafers Orange juice	Midafternoon snack Fruit yogurt	Evening snack Applesauce Crackers

Sample Menu for the School-Age Child and Adolescents

Breakfast Orange juice Fortified cereal Whole wheat toast Margarine Low fat or skim milk	Lunch Vegetable soup Lean beef patty Hamburger bun Ketchup Fresh fruit cup Graham crackers Low fat or skim milk	Dinner Baked skinless chicken Rice Broccoli Whole grain roll Margarine Low fat or skim milk
	Midafternoon snack Raw carrot and celery sticks Low fat salad dressing Fruit juice	Evening snack Apple Peanut butter

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5. American Academy of Pediatrics, Committee on Nutrition: The Use of Whole Cow's Milk in Infancy. *Pediatrics* 1992 89: 1105-1109.
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7. American Academy of Pediatrics, Committee on Nutrition: Cholesterol in Children. *Pediatrics* 1998 101:141-147.
8. Barlow, S.E., Dietz, W.H., Obesity Evaluation and Treatment: Expert Committee Recommendations. *Pediatrics* 1998 102:1-11.